



August 14, 2003

Mr. Rodney Sobin
Virginia Department of Environmental Quality
629 East Main Street, Room 726
Richmond, VA 23219

Re: Summary Notes for Workshops 1, 2, 3, and 4
Virginia DEQ DER/CHP Workshops
URS Project No. 52270-001

Dear Mr. Sobin:

URS Corporation (URS) is pleased to provide the summary notes for the first three Distributed Energy Resources (DER) and Combined Heat and Power (CHP) workshops. This letter report is divided into five sections, the first an introduction, and the last four a summary of comments made during each workshop session. Enclosed in **Attachment A** is a listing of each workshop's attendees.

1.0 INTRODUCTION

The Virginia Department of Environmental Quality (DEQ), supported by a grant from the U.S. Department of Energy (DOE) and the Virginia Department of Mines, Minerals and Energy (DMME), is studying the impediments for the use of DER and CHP, and to develop recommendations for solutions to those impediments.

An initial survey was conducted in 2002 that included numerous interviews and concluded with a summary of the potential impediments to DER/CHP. Consensus Solutions, Inc. prepared the report, dated May 30, 2002.

The second phase of this project is to hold a series of workshops to discuss what solutions may exist to deal with the impediments. URS Corporation, a national engineering consulting firm, was hired by DEQ to facilitate the workshops in 2003. Groups of stakeholders are brought together over a series of four workshops throughout the Commonwealth of Virginia, made up of technology vendors, regulatory agencies, utilities, consultants, environmental and consumer organizations, other NGOs, and local government officials.

Each session is broken into major sections. Each section is opened by a speaker, to be followed by

discussion among the wider group pertaining to that speaker's subject area. The objective of the discussions are to identify barriers to the development of CHP and DER projects, and make a list of recommendations in order to eliminate development barriers. Sessions are closed out with a review the comprehensive list of issues and recommendations for barrier elimination. Some topics have required additional deliberation, so those topics have been continued in future sessions.

2.0 WORKSHOP 1

DEQ Northern Virginia Regional Office

Woodbridge, VA

March 4, 2003

The first workshop was held March 4, 2003 in Woodbridge, VA. Participants included representatives from utilities, project developers, equipment companies, and state and local government. The agenda included presentations by Mike Boswell, Pepco Energy Services; Liz Brown, American Council for an Energy-Efficient Economy; and, Dan Dowiak, Ingersoll Rand.

A significant issue for CHP/DER development is that Virginia has low cost electricity. It can be difficult for CHP to make sense, particularly for small CHP systems. One developer is trying to identify small niche areas, such as biogas and landfill gas projects. DER/CHP can be identified inside the fence rather than exporting energy. However, there needs to be an interested party. Public and private customers have different procurement requirements; so, they need to know up front what the requirements are. Procurement sometimes is difficult, especially with public projects. Anyone can evaluate technical and economic requirements, but it is just as critical to understand the procurement process.

The developer is able to bring third party financing to the project. Leasing arrangements with third party finance can make projects work, especially if the client has a good balance sheet. There are no one-year paybacks. Renewable energy sources and biogas projects have fixed costs that can insulate clients from swings in fuel costs. Note the spread between cost of fuel and electricity. There is a need to define the interests of the parties

Case example of a niche project: Developing 950 kW county landfill with no active gas collection system. The Director is interested in innovation, and this is a small power project. The pro forma just worked using an energy services group. But, it was difficult to make that work with the low electricity cost Virginia has.

The energy services group developed the procurement contract with the county over nine months from

the time of project inception. The county held public meetings and the energy services group signed the contract with the county in September 2002. At that point, both parties felt that major issues had been identified and resolved. They then went to the equipment vendor with 3-4 months lead-time. The interconnection application was filed in October 2002, and the county paid the \$10,000 tariff. Both parties held a series of meetings with Dominion, and still could not order electric equipment or the generator. By December 2002, the February 15, 2003 completion target date was established. In March 2003, the county needed to issue another \$10,000 check for the interconnection study, which would take another 90 days, leaving the end of July to buy equipment. In short, this has not been a good experience for the developer: one year for a small project is too long. Their issue is that they are not building 100-megawatt (MW) peaking unit! (Anything under \$1 million is considered a small project).

From the developer's standpoint: can call and get prices for any technology. No one gets rich off these energy projects. Project has a 1-2% margin. The big issue is that they cannot reasonably determine interconnection costs. The \$10,000 interconnection estimate is low, since they normally run \$30-50,000.

[Utility] Reality of interconnection process is different around the US. There is always an application and a long process. In the niche case, above, someone dropped out and studies had to be done again. It is a very real problem, as the project team had to start from zero. Development is currently not a short process.

FERC has good ideas on small generation projects, but they are not in place. Regardless of project size, the same interconnection study is required to ensure safety of the connection. FERC is looking for changes to help the small projects move through development more quickly.

One developer has been able to work things out so that environmental obstacles would not prevent the project from going ahead. Not enough projects for statistics, but, so far, no environmental obstacles.

Another issue is that developers need good will from regulators for these projects, which are so small. These projects all run 500+ hours/year. The only environmental permitting problems are identified in non-attainment areas. But landfill gas production is an alternative to flaring, and that should be given consideration. Delaware was cited for its policies recognizing the reduction in pollution.

Utility tariffs are a key issue.

There is a need for more clarity on what the regulatory process is: the suggestion is that there be a one-stop shop for the regulatory process, to include local government. Massachusetts and Texas are cited as favorable examples. California is developing a cookbook for doing distributed generation. New York is talking about it. All of these developments would enable developers to see what needs to be done.

But throwing air quality responsibility on the county would involve hiring additional staff.

Is there a good database for aerobic projects? EPA does a pretty good job, but biogas is odd. People are not informed about it, so there is a need for education. Who should do it? General consensus of the group was that the State and DOE should take the educational lead.

Who is the decision maker in the company? Plant operators have to be comfortable with the technology. If the "bean counters" think it may not pay off they are not interested. So, the industry (DOE? ORNL?) is holding regional meetings on the technology.

A lot of advanced preparation is required before going to the county. It is easy to run into a hornet's nest of opposition. The lesson is to spend money up front to publicize and educate what you are planning so that you avoid "rote opposition."

Cannot make economics work in this part of the country, due to low electricity prices in Virginia.

Fortune 500 companies are now interested in renewable energy. The key is that they want to know what the regulatory obstacles will be. That could stem development faster than anything else

ACEEE conducted a state regulatory barriers study in 2002. Emissions and interconnection barriers were identified as the major issues. Found what we have been talking about: utility interconnection costs and emissions are issues in many states. Will talk about what some states are doing to overcome these problems, e.g. New York and Texas. NYSERDA has a huge CHP program. Introduced gas tariff restructuring.

Effect on delivered gas price: Also New Jersey shore area about \$1 mbtu or 10 cents/therm, reduced from \$3. Overwhelming response: tariff of utility not being presented up front.

Non-attainment issue makes CHP important. TCEQ web has how it looks. Massachusetts working on interconnection rules. Talking with FERC.

North Carolina and Pennsylvania examples: all generators have to donate to green energy program. This is being done in New York and Massachusetts. California guidance Rule 21 outlines the interconnection procedure, plus cost: \$1,400 interconnection fee. California gives a rebate of 30% or 40%.

Equipment Certification: New York has a certificate program for equipment. California just installed the certificate. And, utilities always want to better understand proposed equipment characteristics. Using UL 1741 as the equipment standard can eliminate this concern. Utilities may then want you to consider islanding.

Equipment Prequalification: Discussed with FERC. Most small generators connect in distribution rather than transmission. Utilities vary on questions. Large DG customers want one set of rules.

Q. Green fund? A. Eventually that gets paid for in the rate base

Fee added to bill would be preferred to paying it directly. Utilities want to be compensated for loss of load. Utilities figure into their costs an amount that may be transferred to them.

Absent total deregulation are there benefits from distributed generation that consumers can see? Economics of renewable energy cannot compete with large generators. But if one wants to buy renewable energy, it could be a niche market. "People buy bottled water but it is at the fountain." If you want renewable energy you have to pay a premium. If you build preference on these incentives (rather than basic economics) it will be built on a house of cards.

One reason why electricity is so cheap is that the environmental costs are not figured in. Mountain top removal, and air quality and severe non-attainment have to be dealt with. Sometimes the system or market provides perverse incentives. We have a three unit 3 MW diesel that we initialize when the utility asks us to. "Deregulation" is simplistic. There are a lot of things that should be *regulated* but were not, or the market should have imposed but did not. Distributed generation can be a solution.

Without tax credit, energy would not be there. The tariffs structure inhibits renewable energy projects. We are comparing grid production with distributed generation (apples to oranges?). This region has abundant coal and well managed utilities. Question whether incentives will help. We were also selling solar tax credit in 1978. The industry boomed, but it evaporated after the tax credit expired. In the last two years people were selling tax credits; the product was junk. In 2002, twelve landfill gas projects shut down because the Section 29 tax credit ended. Money available from subsidies must be secondary unless project can pay back in 2-3 years, and we would have to look at interconnection costs, plus environmental controls costs, plus other costs. We should pass it to the ratepayer. More in the group favored infrastructure support rather than tax subsidies.

Should there be utility incentives for renewable projects? Recognize that some industrial customers want to be able to say they are using sustainable energy.

Have a regulatory request to expedite renewables, but others in the queue would be pushed backed. Normal queue time is nine months, but for an extra \$25,000 we will add staff resources to do it quicker. Unknown how under Virginia regulatory mandate that could be accomplished.

There should be an expedited process for CHP of (up to) 100 kW. Big issue is deciding what is the amount that will not impact the system?

Need regulatory support from state corporation council.

Gas company owner wants to sell gas, while we want utilities in. When standby charges or exit fees are created it should be in a manner that will not kill the project. (In New York, fee ratchets up if 10% over contract.) If utility causes a "trip" we still would pay. New Jersey has a tariff of \$280 kW for standby service. Incentives should be long term and built into the system.

Just extending gas service to other places will help. If there were an opportunity for a pipeline, DEQ could expedite it.

Distributed generation is incremental to gas distribution. Constant supply is what we are looking at. Still is substantial increase in gas use. Landfill use may flatten load. Enhancing gas distribution and uplink is a good long-term goal. At a meeting with Capstone it was identified that there are still gaps in gas pipeline system.

Mr. Dowiak's presentation on technologies showed reciprocating engines, Cummings and Capstone (flywheel URS and German MAN 50,000 hours before overhaul needed). Also, a Hess 70-350 kW MAN engine design. Capstone is a "household name" for the 30 and 60 kW system. First certified in California and New York.

- IR 70 + 250 kW.
- Fuel cells (in Connecticut).
- Photovoltaics: for 1 MW need 1 sq mile.
- In New Jersey, \$7 gas with 30% efficient generation \$1.1797 kWh (no heat recovery).
- Other states 14-16 cents for 3 MW demand.
- Virginia provides help: gas lines to equipment, meter.
- Simple interconnection possible. Using IEEE Standards 1547. CA Rule 21. NY CERC.
- Landfill gas, interruptible flow or quality drop?
- IDDI 350 Btu - 2500 cu ft? 800-1200 standard for microturbine combustion. Could change the atmosphere. That is what Washington Gas is doing.
- Micro merit 4 every 2,000 hours.
- Showcase a developer, e.g. University of Virginia. One developer complained that he could not get a response from George Mason University to his requests to discuss CHP. How to reach decision makers in a university?
- University of Maryland, College Park prepared DS package. The Esco world has winners and losers.
- Washington Convention Center is perfect case for distributed generation.

DOE regional initiatives:

Web has Dominion Power tariff at www.dom.com. Search "interconnection" and see step-by-step 1,2,3.
<http://www.dom.com/about/elec-transmission/gi-main.jsp>

3.0 WORKSHOP 2

Dominion Energy – Innsbrook Technical Center

Glen Allen, VA

April 3, 2003

The second workshop was held April 3, 2003 in Glen Allen, VA. Participants included representatives from utilities, project developers, equipment companies, and state and local government. The agenda included presentations by Bill Allen, Dominion Energy; Tommy Oliver, State Corporation Commission; and, Daryl Bishop, Chesterfield County Energy Manager.

Considerations for Interconnection:

- Safety and reliability for customers and workers.
- Comparability- treats all generators equally.
- One queue for large and small generators. FERC has a notice of public rulemaking (NOPR) separating large from small, somewhat faster for smaller projects. No consensus on how to define small projects. Pretty much obligated to follow procedures we have been using.
- Non-subsidy for ratepayers.
- Interconnection cost recovery.
- Rates that ensure whoever uses the distribution or transmission system pays fairly for the benefit.
- Adequate study time. It takes a long time, but must be adequate for safe connection.

Queue Process:

Ideal would be that when interconnection request is received, make a quick evaluation of whether the application is adequate. But it is not that simple (showed a complex chart). Have only one process for all size generators.

Process:

- Generator submits interconnection request. Submits N-1 data and a \$10,000 deposit to begin.
- Evaluation study agreement (optional) to study impact on the transmission system. For small systems (define "small"), engineers can quickly determine the impact and then will waive the requirement for an evaluation study.

- Evaluation study (list elements).
- Facilities study agreement and deposit: \$50,000 for large generator. For small, evaluate what cost will be and set the charge accordingly.
- Facilities Study: to determine facilities necessary to create interconnection with generator, and to come up with an estimate of what it will cost to make the interconnection. Study (report) goes back to the generator.
- An interconnection and operating agreement: This is when detailed design and construction begin.
- Contract administration associated with interconnection agreement.

Generator's Cost of Interconnection:

- Evaluation and Facility studies.
- Process administration.
- Engineering review time.
- Legal review and negotiation [Note strong chance of cost recovery and non-subsidy [policy].
- Legal costs go back to the generator.].
- Direct Assign Facilities: hardware, wires, interconnection equipment, breakers etc.
- Radial lines.
- Interconnection and protection equipment.
- System upgrades.
- Communication equipment: there is a requirement to establish a communication link between the generator and Dominion. Phone line connecting sometimes also is a lengthy process.
- Generator's Cost of Operation.
- Monthly facility charge (O&M).
- Distribution transport rate (separate agreement).
- Transmission system (separate agreement) if generator is to sell power into the market.

Queue priority:

- Generator comes in early and gets GI# 1 versus another with #43. Dominion cannot just study one and move on to next. Complexity is that all subsequent studies utilize information collected for #1. It is a headache, nightmare in some cases. When one low number drops out, all that information no is longer valid. Have to restudy.
- Changes in other queue positions: Not likely to get two small generators wanting to connect on the same circuit. We could run into transmission system impact. No way in advance to know that. Information comes out in the study process.
- There must be a Payment Guarantee before Dominion will start detailed engineering or construction. Many cases use a letter of credit, but Dominion Credit Department evaluates what is appropriate.
- Early Initiation Letter: This procedure is available any time after facilities study is signed, if the

generator is confident, it can ask to go forward.

- Facilities study estimates costs. Can proceed with design, construction, any time after facilities study is executed. This may be risky, but if you are confident, you can somewhat expedite the process
- Web posting of information: See **www.dom.com** and click "interconnection." This shows queue posting, evaluation studies completed in past, more information, and complete procedures.
- FERC has a notice on Small Generators. It published a Notice of Proposed Rulemaking for small generators, and discussion associated with that. Dominion does support expedited procedures for small generators but there is no consensus on how that will be worked out.

Q. Cost recovery? A. Not through any generator requests to absolute completion, but for ongoing costs in field interconnection facilities and inspections, these are recovered through a monthly facilities charge. May not be able to determine it until after generator comes on line. Customer-generator is responsible for construction costs incurred by Dominion. Bills are sent monthly. It can take a couple of months for agreement to be filed and accepted. With guarantees in place construction is started. If after the first month, Dominion incurs \$100,000, we bill customer for that and based on the terms of the contract, they pay us, e.g. within 20 days. After construction is completely finished we are obliged to give the customer a final bill. Then we are through with construction.

There is an O&M ongoing facilities charge. It differs from small generator only on distribution differs from that on transmission system. Dominion makes the repairs. Charge is a straight percentage for all projects, whether distribution or transmission. It is a percentage of the direct assigned construction cost. Without compensation for construction cost for generator there is a direct assessment.

Direct assigned, regular line, monthly facilities charge is based on actual cost only. Not on network upgrade cost. After all construction is completed, monthly facilities charge is based on actual cost for the life of the plant.

[Representative, VA Wind Energy Collaborative]: Capital cost of turbine x \$1,000. FERC small turbine. A. Only involved with generators selling on the grid. Net metering,

Q. Evaluation studies. No attempt is made to identify benefit or cost, just the feasibility, "go or no go." Facilities study is more detailed in order to identify what needs to be done, and to determine the cost of the generator to connect. No comparison with system operation impact.

Q. For distribution O & M, what percent of capital cost of generators. A. One percent over the life of the facility.

Q. Small projects for apartment buildings.

Customer would have to participate in a front regulated market in order to participate. Net metering uses other schedules. Smallest generator of the 143 projects on the queue is one MW.

E.g. 500 KW with thermal load. No obligation to Dominion to take electricity unless there is a separate contract. May be other schedules e.g. net metering. FERC regulated market to participate in generation interconnection, and we would not be interested in one less than one MW.

Schedule 19 (on web site) will give list of someone to contact. PURPA has specifics as to what qualifies for a utility to take that power. Use that schedule for negotiated rate.

[Representative, VADEQ] What procedure would be followed for combined heat and power where they are not exporting the power? A. Depends on existing KW provided by Dominion. What required minimums are or demand intervals. May be required to pay that minimum. We look at each case individually.

You need to get approval for any generation. There is the need for safety when power is off line.

[Representative, VA Wind Energy Collaborative] FERC interconnection. Core issue is a problem for this area. Dominion is actively involved with small generators since FERC order last year. There have been many meetings in Washington with other distributed provider representatives and small generators, state commissioners, and FERC providers, through December 2002. They addressed issues that were not addressed in meetings of large generators. Discussions included many issues that should have been addressed in large generators meetings. A loose consensus was achieved, and was filed with FERC in November or December. However, not every one agreed, even though there was consensus among providers and small generators, somewhat less in the than one MW category. There was only some consensus among the 2-20 MW generator group.

FERC said they would come out with ruling in a NOPR around March. We have been hearing they may not issue the NOPR until late spring, early summer. FERC has a lot on its plate. What was discussed during small generators meetings should be incorporated in a large, standard market design. We are trying for one ball of wax, but it is much too large to control. Expect to see more progress in the summer or fall.

[Utility representative] Legislation is on hold until Jun 2004, which keeps Dominion going until then. We are still looking into joining PJM, and once Dominion does join, then the generation interconnection process will merge with PJM. PJM submitted their own set of interconnection guidelines and procedures at the same time FERC came up with guidelines for everyone else in the country. FERC said that they will put it to the side until they look at all others first. What may happen is that when FERC comes down with a decision, PJM and everyone else will do one thing, and PJM will move forward with their own plan. This will result in having two sets of procedures. A lot of what we did with small generator NOPR was from PJM procedures.

Q. Technical differences? A. May allow for regional differences. Cannot fully address that.

[Utility Representative] Point raises philosophical question about standardization. Basically standardization can be a red herring, used by those looking for anything useful to their cause. Standard Market Design gets support when it suits one interest or another. There are differences in systems, configurations, arrangements, etc. that are very real. Standardization has some benefits. We have done a lot of work on net metering on tariffs for our companies, and we treat standardization very carefully, not as a panacea. The FERC order issued April 1 authorized Dominion joining PJM.

[Consultant] I have heard arguments for 10 years in individual cases where utilities decided they do not want to deal with the issues and make it as difficult as possible to move forward. No utility in its right mind wants to write up interconnection requirements. Utilities write interconnection requirements on very large projects where everything has to be unique.

Once PJM goes through and has a number of programs, you will deal directly with PJM and get paid by PJM. You will have to meet capacity reserve. PJM response is that requirements are not mutually exclusive. As PJM expands into other areas, that issue will come into play.

Comment on green power requirements. More lucrative proposition that encourages distributed power generation that can address some of the regional differences, and deals with differences in how systems operate. Standardization may have to be put into the federal level to encourage some form of interconnection. There is a dilemma in the lack of consensus for the 30kw to 1 MW group. Below 30kw, net metering is provided only for certain types of generation.

Q. Differences among projects in multiple regions?

[Technology Vendor/Developer] Differentiate what was in the presentation that related to administration of interconnection. In the multi states projects we deal with, the administrative aspects are fairly well spelled out. Mostly it is posted on their websites. Some did require calls three times to get the information.

[Technology Vendor/Developer] PJM requires a \$100,000 deposit at facilities. Technical differences are more important. Virginia is relatively simple compared to some states. There are only 2-4 dominant interconnection entities you have to deal with technically. Older metro areas can have two adjoining service areas 20 miles apart with radically different costs. The same generator may have 3-10x multiple of cost. It comes down to differences in the systems, above or below transformer, neutral or not. There are a tremendous number of technical issues that begin to add cost or multiply cost to your facilities. For example, two different locations can have very different costs.

Distributed generation costs: how to create benefits to help utilities participate? If it reduces a utility's

load, e.g. when PJM prices are sky high, having distributed generation would be an agreeable thing, and they may see their way through to it. Historically there has not been a real incentive. Utilities have concerns about safety issues, and insist that they do not realize any benefits. It has to be a win-win situation. Not sure about wireless control around the state. How to create the climate for that?

[SCC Representative] PJM procedure? Legislation was on the table and then on hold. Referred to PJM as landlocked. Not that it is a concern, but PJM has that retail command control available to dispatchers. We do not have it here but it works well in PJM. Use PJM as a model, rather than looking at aggregation from the municipal standpoint.

[Utility Representative]: Agrees we do not allow any difference in the process for the small generator. There is somewhat of a reliability position for us for at peak.

[Representative, VA Wind Energy Collaborative] Consider micro technology and air pollution credits. They are now saying Dominion has no economic incentives for connection. How can we bring economics and technology together to make it work?

[Utility Representative] Collectively there are advantages, but how can we get them down to Dominion's level? Satisfying peak would drive Dominion.

[Representative, VA Wind Energy Collaborative] Are technology advances the answer?

[Utility Representative] More likely it will be marketing, financial rewards and benefits. Most important thing in Allegheny is PJM, which has a liquid price market. After 10:00a.m, the price is 5.2 cents. If you want to trade x cents PJM would be more attractive. Prices are impacted by what market players do. Market is fluid, a reasonable representation of what energy prices are, not only hour-to-hour but instantly. We have day-ahead, hour and instant markets. Active load management: a/c switch type programs are PJM load management. Benefits are given to those in place. Later system is demand response: through November, emergency and economic plan. Emergency is non-market driven: \$500mwh minimum price. Economic price is \$70. Because PJM has real market prices it is far easier for players to participate with some economic certainty.

[Consultant] There are different economic scenarios for large generators selling energy, which are different from the economic scenarios for someone with a generator who can dispense. There is another economic scenario for the CHP generator who has to keep running for his heat load. To talk about what to do to promote them you have to distinguish among these. With CHP, utilities lose sales; it is not generation reacting to variable load. You have to apply different economics to account for it than for someone with a backup generator responding to an emergency or energy supplier program. You have to address the different scenarios. Pricing will be easier to build. These economic models build from different standpoint and you need to know each. Here is the impact, what is the result you want?

[Consultant] There are different loads. Distributed generation to the Outer Banks needs to reach a threshold or you have to pay anyway. Need to take a micro look at the rest of the state. The small generator is so small compared to a 1,000 MW generator.

How to get things to happen? Force it by regulation or rely on the market? Recognize that the market can provide for the variety of product situations. Tariffs may be higher price but transmission and generation constraints will deal with them. Overall strategy should be considerate of a policy that pushes toward the market.

Rules being developed to deal with 30kW to 10 MW. Fill out a notification on a form that is on the website.

After 30 days, certified by an engineer, a licensed electrician that installed the system under the national electric code, IEEE compliant. Utility then cannot stop you. Has 30 days to review it and then give access to your facility.

Net metering from 1999 omnibus bill opened up retail choice. These are my views, not commissioners'. With net metering it is the customer's choice whether to take power from a utility or its own generators.

In 2000, adopted new rule: 6-8 solar panel owners interconnected. Utilities were very accommodating and helpful.

Standardize: see web site for rules and notification form. It applies to every facility anywhere in Virginia. Since then we had parties urging staff to adopt a broader set of rules to apply to other fuel types. In March 2002, informally issued a set of rules. AEP and Dominion responded. Sent it to 50 parties but only got 6 responses. IEEE had not adopted. NARUC is working on standards to be applied in many states. Not sure where our jurisdiction will be when FERC is done. It is difficult to standardize tests for rules like net metering and interconnection. Each facility has different cost and equipment. Recognized in rules that small scale DER will be in premises that should not be lumped in with coal generating facility. IEEE finalized its standard guide but did not publish it. FERC is still working on their rules.

Where is Virginia commission? Look at NARUC, IEEE and FERC and merge rules. (To get on the distribution list call (804) 371-9358 or go on web: www.asdc.state.va.us.)

Q. What size will be covered for distributed generation? A. Unrestricted MW certificate of necessity. Still is a significant undertaking. In Pennsylvania, you don't have to go before State Corporation Commission to sell power. In Virginia you have to do that unless you are a qualified facility (QF). Rules are proposed for up to 20 MW.

[Technology Vendor/Developer] For a system less than 50 MW the procedure is no different from what I followed when I did 500 MW project for a shopping mall or a warehouse. Have issue with nothing relatively simpler. Rules have been drafted to deal with that. But now there is no such rule. There is a tremendous gap.

Q. [Consultant]: What are utilities doing on legislation? A. Consumer Advisory Board has it under consideration. See website for interim rules.

[Consultant]: We looked at the standard boiler plate used around the country and then created the VA legislation.

[Consultant]: I have smaller clients. I see a lot of opportunities to put in renewable energy, but the economics are not there. When you limit net metering to 20kW it is impossible to make the economics work. Roofs for all schools could hold solar photovoltaics, but it would never pay it off at the cost of a 25kW system. Schools are at minimum loads. They could go back in session in the fall with a credit if it were allowed. Now there is no credit and they are limited to 25kw in taking advantage of the opportunity. 10kw for residential and 25kw for nonresidential, nets out annually. Nets after annual base is met. Schools are looking at 300-400 kW. 25kw seems rather small. This is a statutory limit. Many are marginal technologies. The consultant is not aware of any significant cost benefit from a balanced plan.

There are other things you could do with that kW, e.g., wheel it up to a program. Green Mountain might be interested in buying it.

[Technology Vendor/Developer]: There is an administrative challenge. It could be a lot simpler. Best approach would be to make a utility indifferent by dealing with lost revenues. That is an aim of green energy policy.

In the open market is not necessarily the utility's aim. North Carolina is involved in setting costs. The program for utilities collecting doesn't start until July. It is difficult to find anyone even within the organization who understands it.

Another option is offered by Pennsylvania: it is to allow utilities to provide the service. If they interconnect generators they lose sales. Allow them to provide distributed generation. Deregulate the commodity price. From SCC legislative point of view, the commodity is deregulated, so any time you manipulate how that price is set you are damaging a very fragile market in Virginia.

[Consultant]: statutory limits are set through a compromise process. 10kW versus some larger interest. There is no real firm technical basis for the numbers.

[Attorney] How much distributed generation is there now in Virginia? A. [Utility Representative] It is very low. We have no numbers.

[Technology Vendor/Developer] 52.3 MW on system right now, as of 7:00 this morning, Goes back to 1989. Some, under rule 19, converted over. Once had 16 MW under contract to Dominion, but no longer. Allegheny had 12 MW in their system since last Thursday.

[Utility Representative]: We have around 50 MW - more in queue. How much? See the queue. There are 143 projects on the queue. Some generators put in multiple applications for the same location: 250, 450, 1,000 MW. Add it up and you have 50,000 MW. In reality it is likely that only one of five queue positions will be connected. More realistically is that none have customers, so they back out at the last minute, and then we see five more projects put back the at the same location. Look at the maps on the web sites. Not every utility has that on its web site. Some cooperatives don't have a web site. They are not required to have one. We update monthly. We have had a lot of withdrawals in the past year because of the financial situation. There is a cascading effect on other independent power producers. Cannot give a good answer. Would have to ask each, "How many of the five are you going to do?" Now have 50 MW - some rated 24MW, some 3MW. Highest would be 24MW. (Specifications for cogeneration are equivalent to Rule 19 in VA).

[County Representative] 20 parties attended a net metering workshop but only one provided testimony. Only one comment came in.

Chesterfield County is advertising for an energy manager. County has an alternative energy site for turning methane gas into useable energy via special recovery and refinement process.

Local governments involvement in demand side. Cleaner sources of power usually from distributed generation uncoupled from electric system. There is no certification process in Virginia. There are urban versus rural differences. Chesterfield County has a microturbine project: alternative energy on web site. What are benefits of a landfill gas microturbine? It reduces emission of methane gas, etc. Project is in the 30kw range, providing power for 15 homes on average. Will reduce greenhouse gas equivalent to 250 cars a year. They have a \$20,000 EPA grant for the purchase of the equipment. \$42,000 grants requests to fund teaching part of the demonstration. A microturbine team has been assembled to develop this as teaching tool.

Dominion Power is involved with microturbines. It has a teaching site: microturbines with SOL. The website has three learning levels. Specifically tie SOL to each teaching module. It is 21 times better for the environment.

Cost analysis of running the system shows the economics of each project. Discount purchase at half price. Clean up costs also have to be included. When available energy reaches 35% or 50%, drops

down from more than six to five years. Whether it turns out to be 2.7 cents kWh or 6 cents, the grant reduces payback period. There is not enough knowledge about how long these are going to last. Will they require rebuild in mid-year? Hope to document not only the earth science involved, but also the economics.

Q. Cleanup costs: consider additional units being put in with different, lower cleanup costs later. The site can handle 60 of these.

List of what we determined in today's discussion and what topics to take up at the next meeting.

- Environmental issues.
- Microturbine Virginia Tech is working with a county [company?] taking methane from mines. Where are they in that process? Mike Karnil?
- Federal money? Grants loans?
- Lou Harris EEI on pricing dynamics.
- Blending design criteria with more traditional green projects design.
- Green construction projects for schools are developing energy on site as part of the design process. Architects mostly?
- Interconnection?
- Time frame for a deliverable to DOE. Influence policy in whatever direction. Can provide ammunition to use within our agency regarding air permitting. Forum to help others understand what the barriers are. There is some literature out there already; but we want to know measures we can take in Virginia. A lot will be done in legislation. The process creates conversation. We will do outreach. Communities will do some. This is a little nebulous, but some tangible.
- Create an advisory board? Transparency is to be encouraged.
- Web site is good.
- Interconnection barriers, potential economic and market demand response, green attribution: get a better feel for the big picture for incentives. The technology is advanced to a point where it is more reliable.
- Need a faster track approach for the regulatory system treatment of small versus 500 MW projects.
- Manufacturers?
- Local process involvement- would be helpful to have representatives explaining their process e.g., Ingersoll Rand.
- Set up website. Make the Dominion power point available?
- Have someone from pricing in Dominion: small scale does not cost a lot, and guess what, it is not worth a lot. Their economy of scale, having someone from rate side.
- Three large utilities are represented here. Consider interconnection with cooperatives; their procedures may be very different from ours. Invite someone from EEI on this?

4.0 WORKSHOP 3

DEQ Tidewater Regional Office
Virginia Beach, VA
May 6, 2003

The third workshop was held May 6, 2003 in Virginia Beach, VA. Participants included representatives from utilities, project developers, equipment companies, and state and local government. The agenda included presentations by Rodney Sobin, VADEQ; Mike Kendall, URS Corporation; and, Mitch King, Old Mill Power Company.

[Power Marketer] Why can we not omit all the NO_x we want in the Tidewater Region of Virginia, given it will all blow out to sea anyway? Still need to meet BACT requirements.

Virginia has no certification for technology, and VADEQ does not have vendors pre-approved. Some neighboring states do have this. Would be helpful for VADEQ to implement this, and to coordinate with FERC. Also, propose an interconnection certification list with common definitions and descriptions to meld with FERC.

Is there anything in Virginia similar to California's Rule 21? No, not yet.

Dominion cancelled some DER/CHP projects/business plans in 2001/2002 because rate caps affected the project economics.

Small DG equipment should be treated as permitting priority by VADEQ.

INGENCO operating in three states and making a profit, but the environment is very competitive.

Current regulatory system does not work for a "what if" scenario – data collection/R&D clause should exist that would allow for continuous technology evolution to improve/reduce emissions. Pennsylvania allows flexibility under similar rules.

Without an incentive or premium, it is difficult to justify distributed generation. The only benefit of being on the system is that it provides a market.

Two-year limit on municipal aggregation.

Cities will not likely explore feasibility of installing peak shaving if they have no experience with it.

Local authorities have jurisdiction and a need to educate small businesses – provide outreach.

Title V regulatory barrier is that it opens the permit to public review, and the monitoring is burdensome.

Power Purchase Agreements (PPA) at fixed and defined rates are less available now than in the past. Also, PPAs at uncertain rates per kWh are rarely “bankable.” Therefore, the barrier is the manual disconnect of meters. Also, Permits should describe generic equipment specifications – not identify technology by vendor’s specific name.

5.0 WORKSHOP 4

DEQ Northern Virginia Regional Office

Woodbridge, VA

June 5, 2003

The fourth workshop was held June 5, 2003 in Woodbridge, VA. Participants included representatives from utilities, academia, local government, equipment manufacturers, regulatory, and electric transmission providers. The agenda included presentations by Louis Harris, Edison Electric Institute (EEI); and, Scott Miller, PJM. There were also some brief preliminary remarks made by Christian Fellner, from EPA’s CHP Partnership.

Mr. Fellner distributed a brochure developed and issued by EPA regarding CHP, and shared that EPA has been involved voluntarily in CHP projects for the past 3 to 4 years. This CHP Partnership branch was officially created within EPA in October 2001. This partnership group works with developers with the assistance of EPA, who act as mediators within the environmental permitting arena. EPA also recognizes projects, in an attempt to educate the public and promote education and public interaction. EPA’s goal is to bring partners together to promote the advancement of CHP technologies and project development.

Mr. Harris presented EEI’s assessment of distributed generation projects. Fundamentally, DG is being packaged within the context of larger projects. For example, First Energy has successfully installed 400 MW of DG throughout PJM, as part of larger projects. Mr. Harris also shared the story that ConEd saved the day by keeping power up on 9/11 due to its expansive DG network in New York City. However, other utilities, which generally have a healthy skepticism of DG, were determined to install DG in their systems to later identify that DG was in fact not the optimal solution.

The economics of DG are not encouraging, in that it is relatively expensive to install for what you get. The barrier, as Mr. Harris identifies, is not so much stand by rates, but, rather, stand by costs. The

bottom line is that at the heart of the problem for DG is cost.

EEI does favor streamlining the interconnection procedures, to level the playing field for smaller developers and projects with larger projects. However, it is a fallacy that DG does not have an impact on the grid.

Mr. Harris also feels that air quality issues could be substantial on the local level, and questions the wisdom of relaxing those air quality rules in favor of DG projects.

[Attorney] What is the status of IEEE's interconnection regulations? A. [Harris] IEEE will present their official plan around June 25, 2003 to discuss the new standards and testing procedures. They are trying to minimize differences and create predictability.

[Academia] Is the deferral of equipment due to a shorter lifecycle? A. [Harris] We will likely see DG grow in areas of population growth.

INGENCO equipment is very modular, so no major overhauls are required.

[Attorney] In most states NOx allowances are allocated to the larger generators – is this a disincentive to the smaller generators? A. [Harris] Public policy should be neutral on renewables – there should be no favoritism of fuel types. What would be fair would be to apply all the regulations to all developers/operators uniformly. The FERC ANOPR and MOPR process addresses how to do this.

Mr. Miller presented a discussion regarding a general overview of PJM and their outlook on Virginia. Mr. Miller feels that there is a symbiotic relationship between DG and demand response. PJM currently has 65,000 MW in its system. The benefits of the PJM approach include:

- Data is available equally to incumbents and non-incumbents;
- Price comparison is available;
- Provides incumbents with additional markets to participate in;
- Provides access to multiple buyers and sellers;
- Eliminates conflicts of interest; and,
- Provides opportunities for non-traditional generation.

PJM provides for an expedited process for small, less than 10 MW, projects. A “super” expedited process is also sometimes available. The deposit is usually waived for small projects. Peak loads in the summer of 2002 far exceeded those for 2001, but super peak prices in 2002 were still lower than those in 2001 due to incentivized investment in PJM. PJM needs to better facilitate demand response. PJM's goal is to create a level playing field among all generators, providing ends result in which customers are the winners.

[Technology Vendor/Developer] When will PJM have the stakeholder meetings with small generators?
A. [Miller] In the fall of 2003.

Demand will become elastic if adjoining states make their markets more homogenous.

[Attorney] To what extent have you looked at equalizing the playing field in terms of environmental concerns (NOx credits)? A. [Miller] PJM does not get involved in environmental issues, however agrees that environmental concerns should be a strategic planning issue.

10 MW is the magic number for PJM involvement in generation projects – anything less than 10 MW is dealt with by the local utility.

§

We have enjoyed supporting you in this project. Should you have any questions regarding this summary, please contact me directly (tel. 804-474-5447).

Sincerely,

URS CORPORATION

A handwritten signature in black ink, appearing to read "Diana Rodriguez", with a long horizontal flourish extending to the right.

Diana Rodriguez
Principal, Power Sector Services

Attachment

ATTACHMENT A

Listing of Workshop Participants

WORKSHOP 1 - March 4, 2003 attendees in Woodbridge, Virginia

Mike Kendall	URS
Mike Boswell	Pepco Energy Services
John Peck	Rappahannock Electric Coop
Jeff Plesur	Rappahannock Electric Coop
Bob Groberg	HUD
Liz Brown	American Council for an Energy-Efficient Economy
Dan Dowiak	Ingersol Rand
Michael Willingham	Virginia Tech Research Center
John Morrill	Arlington County
Bill Allen	Dominion Power
Bruce Hedman	Energy & Environmental Analysis
Lauren Giles	Energetics, Inc.
Carolyn Drake	South States Energy Board
Randy Smidt	SpecPro Inc.
Charles Foster	Commonwealth Green Energy
John Borgerson	Geotrans, Inc.
Doug Martin	SpecPro Inc.
Rodney Sobin	Virginia Dept. of Environmental Quality
Keith Boisvert	Virginia Dept. of Environmental Quality
Frank Burbank	Virginia Dept. of Environmental Quality
Diana Rodriguez	URS
Chris Montgomery	URS

WORKSHOP 2 - April 3, 2003 attendees in Richmond, Virginia

Bob Groberg	HUD
Bill Allen	Dominion Virginia Power
Ken Fugett	Dominion Virginia Power
Darryl Bishop	Chesterfield County Energy Manager
Joe Lenzi	2rw Consultants, Inc.
Tommy Oliver	State Corporation Commission
Ed Petrini	Christian Barton Law Firm
Joe Catina	INGENCO
Rick McWhorter	INGENCO
Barry Thomas	AEP
Garry Simons	AEP
Edward Johnstonbaugh	Allegheny Power
Jerry Walker	Henrico County Energy Manager
Debra Jacobson	GWU Law School
Skip Smith	Pepco
Tim Bernadowski	Private consultant
Rodney Sobin	Virginia Dept. of Environmental Quality
Keith Boisvert	Virginia Dept. of Environmental Quality
Frank Burbank	Virginia Dept. of Environmental Quality
Diana Rodriguez	URS
Chris Montgomery	URS

WORKSHOP 3 - May 6, 2003 attendees in Virginia Beach, Virginia

Mike Kendall	URS
Bill Allen	Dominion Virginia Power
Ken Fugett	Dominion Virginia Power
Joe Catina	INGENCO
Garry Simmons	AEP
Ed Johnstonbaugh	Allegheny Power
Mitch King	Old Mill Power Company
Larry Blanchfield	Northrop Grumman – Newport News Shipbuilding
Tiffany Ronsonet	Northrop Grumman – Newport News Shipbuilding
Paul Cramer	Norfolk Redevelopment and Housing Authority
Davis Phaup	Old Dominion Electric Coop
Himesh Dhungel	STM Power, Inc.
Laura Corl	Tidewater DEQ Office
Barry Halcrow	Tidewater DEQ Office
David Sellars	Tidewater DEQ Office
Rodney Sobin	Virginia Dept. of Environmental Quality
Keith Boisvert	Virginia Dept. of Environmental Quality
Frank Burbank	Virginia Dept. of Environmental Quality
John Warren	Virginia Dept. of Mines, Minerals and Energy
Diana Rodriguez	URS
Chris Montgomery	URS

WORKSHOP 4 - June 5, 2003 attendees in Woodbridge, Virginia

Mike Kendall	URS
Michael Willingham	Virginia Tech research Center
John Morrill	Arlington County
Bill Allen	Dominion Virginia Power
Ken Fugett	Dominion Virginia Power
Tim Bernadowski	Energy Consultant
Joe Catina	INGENCO
Barry Thomas	AEP
Gary Simmons	AEP
Davis Phaup	Old Dominion Electric Cooperative
Debra Jacobson	GWU Law School
Christian Fellner	EPA CHP Partnership Division
Scott Miller	PJM
Louis Harris	EEI
Rodney Sobin	Virginia Dept. of Environmental Quality
Frank Burbank	Virginia Dept. of Environmental Quality
Diana Rodriguez	URS
Chris Montgomery	URS